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Research Article

Malignant Otitis Externa in Developing Country

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Abstract

Objective: Malignant otitis externa is a potentially life threatening infection of external auditory canal and skull base in an immunocompromised person. The outcome tends to be fatal due to the skull base osteomyelitis, especially if diagnois is delayed or is poorly treated. This epidemiological study in developing country is aimed at sensitizing for high level of suspicious early diagnosis and treatment.

Method: This is a prospective study of patients with diagnosis of malignant otitis externa managed in a tertiary hospital between year 2012 - 2016. All consented patients with the disorder were enrolled into the study. Data obtained were collated and analysed.

Result: Nine patients with malignant otitis externa were seen during the study period. Male to female ratio was 1:1. The peak was between 61 and 70 years. The most frequent symptoms were otalgia 9 (100%) and hearing loss 9 (100%) while cranial neuropathy was encountered in 6 (66.7%). The most implicated microganisms was Pseudomonas aeruginosa 7(28%). All patients had combination of both medical and surgical intervention. There was 1death (11.1%).

Conclusion: Malignant otitis external is a complication of diabetes with high morbidity, however prompt diagnosis and treatment could mitigate the mortality.

Keywords: Malignant otitis externa; Diabetes; Immune compromised patient.

Introduction

Malignant otitis externa is a fatal, progressive and aggressive infection of the external auditory canal extending to the temporal bone and base of skull in immunocompromised individuals, elderly diabetes mellitus are often especially affected. There are microorganisms which could be responsible but infection with Pseudomonas aureginosa is the most common [1].

In 90% of cases, the disease involves Pseudomonas aureginosa infection in the elderly diabetic. Infrequently, it affects younger age groups who are immune compromised eg HIV, AIDS and malnutrition. The most common offending organisms is 95% Pseudomonas aeruginosa. Other infrequently incriminating bacterial are Staphylococcus aureus, Klebsiella spp and fungal eg Aspergillus species [2,3]. The infections begin in the external auditory canal and spread along the vascular and fascial planes, extending into the temporal bone through the external auditory canal osseocartilaginous junction or fissures of Santorini [4]. The infection causes bony erosion to involve intracranial structures which is the main cause of death. In addition to this, patients who are elderly and diabetics have innate defects in chemotaxis and phagocytosis of polymorphonuclear lymphocytes, monocytes, and macrophages which aid spread of the disease. The disease is staged based on extent of soft tissue and bony involvement or development of neurologic complications [5,6]. In stage l, the disease is limited to the external auditory canal, in stage ll there is extension to temporal bone with cranial

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nerve neuropathaties and, in stage lll, there is intracranial extension. Stage l has a good prognosis while stage lll is fatal at presentation.

The clinical features include: painful external ear canal and the ipsilateral jaw, purulent otorrhea usually offensive, hearing impairments, and occipital and temporal headache. There may be associated facial and pharyngeal symptoms in advanced cases. Clinical examination revealed tender pinna, edematous pinna including external auditory meatus and granulation polyps [7-9].

Diagnosis is made by high index of suspicion, microbiological culture of the organism and radiological investigations which include Computerised Tomography Scan (CT scan) and Magnetic Resonance Imaging(MRI). CT Scan is the investigation of choice as it delineates subtle changes in bone density and establishes the extent of soft tissue swelling. Radioisotope scans are also useful for monitoring treatment response, particularly Technetium 99. Serial monitoring of CRP and ESR can help to evaluate response to the administered antibiotics.

The management includes meticulous aural toilet, antibiotics such as Ciprofloxacin or antifungal agent and blood glucose control in patients with diabetes [10-13]. Hyperbaric oxygen can be considered for cases with intracranial complication. Surgical management mostly limited to biopsy for microbial and histological diagnosis. Histologically, granulation tissue is characterized by non-specific inflammation with inflammatory cell infiltration and hyperplasia of squamous epithelium [14].

This prospective study is aimed at identify the possible complications, clinical manifestations, diagnosis, and management outcome of malignant otitis externa in our study population.

Materials and Methods

This is a prospective hospital based study. The patients with a diagnosis of malignant otitis externa were seen over of 5 years, January 2012 to December 2016.

The study was carried out in ear, nose and throat clinic of ENT Department of Ekiti state university teaching hospital located in south western part of Nigeria. This is one of the centre for management of diabetic mellitus.

Informed consent to be enrolled into this study was obtained from the patient or guardian before their enrollment into the study.

Interviewer assisted questionnaires were given to obtain information from the 9 patients or guardians. The data obtained were on biodata, presenting complaints, detailed ear, nose and throat history, past medical history, family and social history.

General physical examination to determine patient health status. Detail ear, nose and throat examination was performed to determine the extent of the disease.

Management information data were obtained and documented. These also includes detail data on requested investigations, medical and surgical treatment.

The data obtained were collated and entered into and analysed using SPSS version 18.

Results

A total of 9 patients presented with diagnosis of malignant otitis externa out of 10,014 patients seen during the study period. There were 5 male with 4 female with a Male to Female ratio of 1:1. The mean age of the study group was 64 years. Table1. The peak age involvement was 61-70 years.

Diabetic mellitus was implicated in 8 (88.9%) while AIDS was found in 1 (11.1%)

Microbiological study of ear discharge and tissue biopsy from wound debridement culture and sensitivity revealed 7(28%) Pseudomonas aureginosa. Staphylococcus aureus with Klebsiella sp were noted to account for 1(11.1%) each. This is shown in figure 1.

In our study of malignant otitis externa, 77.8% present with diseases of maximum duration of 8 week duration while it is more than 8 weeks in 22.2%. The findings on clinical history and examination were 100%of earache, and tender ear while least finding was 3(33.3%) of fever. Right ear was responsible for 66.7% while left ear was responsible for 33.3% cases of the malignant otitis externa. We recorded 100%cases of unilateral malignant otitis externa.As shown in figure 2. Malignant otitis externa affected 66.7% of right ear while 33.3% of left ear was noted but no bilateral ear was recorded.

Associated complications of malignant otitis externa were 6 (66.7%) cranial nerve palsy as commonest, infratemporal and neck space abscess in 1 (11.1%) each. No associated complication in 2 (22.2%) of the patients studied. There was no mortality in any patient studied. As it was revealed in table 2.

Age group/years	Frequency/n
51-60	2
61-70	4
71-80	2
81-90	1
	Total=9

Table 1: Age distribution of patients with malignant otitis externa

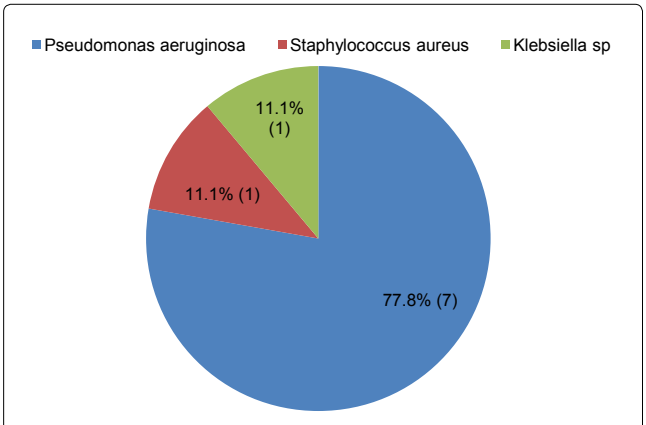

Figure 1: Bacteriology of malignant otitis externa

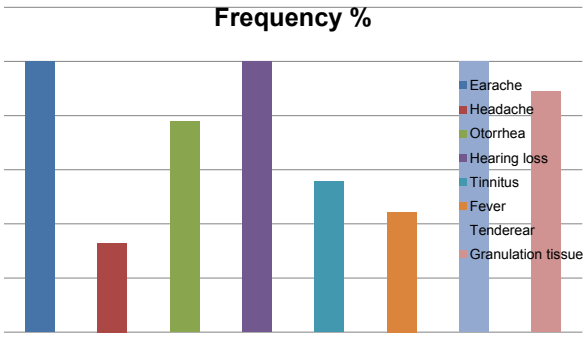

Figure 2: Clinical features of patients with malignant otitis externa

Complication	Number	Percentage(%)
Nil	2	22.2
Cranial nerve palsy	6	66.6
Neck space abscess and gangrene	1	11.1
Infratemporal abscess	1	11.1
Septicemia	1	11.1

Table 2: Complication of malignant otitis externa

All the patients had combination of both medical and surgical intervention.

Discussion

This rare fatal malignant otitis externa was found to be more common in males than females in previous research work. Same study revealed high mortality over a period 10 years of more than half of the studied patients [15]. Our study showed equal male to female proportion and mortality of less than 50% of the studied population. These findings may be due to high rate of suspicious of malignant otitis externa among diabetes mellitus patients at the study centre.

Malignant otitis externa typically arises in patients who are immune suppressed. The most commonly affected immunosuppressed patients is diabetes mellitus in elderly patients. While it occurred in younger age patients who are AIDS, malnourished, or immune suppression from cancer and chemoradiotherapy [16,17]. Diabetes mellitus was responsible for 88.9%, majority of our cases of malignant otitis externa.

The most common implicated causative microorganisms is bacterial and Pseudomonas aeruginosa in about 90% of patients [17]. Pseudomonas aeruginosa account for (77.8%) of our studied population. This study revealed less commonly isolated causative organisms to be Staphylococcus and Aspergillus [18].

Malignant otitis externa start from external auditory canal and spread to base of skull with intracranial extension and neck extension leading to various complications [19-21]. Documented

complications in previous studies includes osteomyelities, cranial nerve palsy, meningitis and brain abscess. In diabetes, factor such as microangiopathy, hypoperfusion and diminished host resistance contributes tremendously to these pathogenesis [22]. This work revealed absence of complication in 2 (22.2%) while facial nerve affectation occurred in 6 (66.6%).

Clinical presentation of malignant otitis externa are often present with an earache, ear discharge which does not respond to standard treatment regimes of ear toilet and antibiotic therapy [23-25]. This condition may also present with cranial nerve palsies, trismus when the pathology extended beyond the external auditory canal. All, 100% of our studied population presented with otalgia and this is similar to other documented findings in previous research [15].

In the early management of malignant otitis externa debridement and biopsy of the external auditory meat us with subsequent cultures and sensitivity were repeated during the early phase of our management as in previous study. Treatment for the disorder also requires initial hospitalisation for aggressive targeted antimicrobial therapy based on microscopy, cultureand sensitivity results. Our treatment régime includes combination of both surgical and medical therapy. The outcomes of treatment depend on the disease stage at presentation. Only 1 (11.1%) of our patients presented with stage lll. Our mortality record was 1 (11.1%). Prompt diagnosis and antibiotic administration has improved our mortality and morbidity results. It is still alarming that mortality remains around 33% and increases to 80% with cranial nerve involvement in previous findings[15]. However the predictor of complications includes skull base osteomyelitis, and multiple cranial nerves.

Conclusion

Malignant otitis externa remain uncommon pathology in otorhinollaryngological practice worldwide. Early diagnosis with prompt, timely and appropriate management will produce good outcome. It is therefore advised that diabetes patient with earache should be promptly referred by their managing physician.

Conflict of Intrest

The authors declared that there are no conflicts of intrest.

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